MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
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RM Number: 8785
MSDS Number: 8785
RM Name: Air Particulate Matter on Filter Media

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Description: This Reference Material (RM) 8785 is intended primarily for use in the evaluation of analytical methods used to characterize the carbon composition of atmospheric fine-particulate matter (PM) for national air quality monitoring programs. This RM consists of only the fine fraction (nominally < 2.5 μm aerodynamic diameter) of SRM 1649a *Urban Dust* (collected in an urban area from 1976 to 1977) resuspended in air and filtered onto quartz-fiber filter. A unit of RM 8785 consists of three loaded filters, each uniquely identified by their APM identification number (e.g., APM 1257) their production characteristics, and batch and chamber-column-row (e.g., 12959-30 and IV-D-5, respectively), and their mass of fine SRM 1649a on the filter (e.g., 1948 μg). A filter (process) blank is available as RM 8786.

Substance: Laboratory preparation of complex mixture of air particulate matter.

Other Designations: Not applicable.

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component	CAS Registry	EC Number (EINECS)	Nominal Mass Fraction (%)
Lead dust	7439-92-1	231-100-4	1
Iron dust	7439-89-6	231-096-6	3
Sulfur dust	7704-34-9	231-722-6	3

Index, R/S Phrases (EC): Xn, N, T; R20/22, R33, R61, R62; S45, S53, S60, S61
See "Section 15".

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = Not applicable Fire = Not applicable Reactivity = Not applicable

Major Health Hazards: Nerve, kidney, brain, and liver damage, birth defects, cancer hazard in humans.

Physical Hazards: Not applicable.

Potential Health Effects (short term exposure)

Inhalation: May cause irritation to the mucous membranes and respiratory tract.

Skin Contact: May cause irritation.

Eye Contact: May cause irritation.

Ingestion: May cause vomiting, diarrhea, stomach pain, chest pain, visual disturbances.

Listed as a Carcinogen/Potential Carcinogen[1]

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	X	
In the International Agency for Research on Cancer (IARC) Monographs	X	
By the Occupational Safety and Health Administration (OSHA)	X	

4. FIRST AID MEASURES

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration, if not breathing, by qualified personnel. Get immediate medical attention.

Skin Contact: Rinse affected area with copious amounts of water for at least 15 minutes while removing contaminated clothing. Get medical attention, if needed.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Get immediate medical attention.

Ingestion: If a large amount is swallowed, get immediate medical attention.

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible.

Extinguishing Media: Regular dry chemical, carbon dioxide, water, and regular foam.

Fire Fighting: Use extinguishing agents appropriate for surrounding fire. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point (°C): Not applicable **Autoignition (°C):** Not applicable **Method:** Not applicable

Flammability Limits in Air (Volume %) – Upper: Not applicable **Lower:** Not applicable

Flammability Class (OSHA): Not applicable

6. ACCIDENTAL RELEASE MEASURES

Occupational Release: Collect spilled material in appropriate container for proper disposal. Refer to Section 13, "Disposal Considerations".

7. HANDLING AND STORAGE

Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances. Wear splash resistant safety goggles. Wear chemical resistant clothing and gloves. An eye wash station and washing facilities should be readily available near handling and use areas.

Safe Handling Precautions: See Section 8, "Exposure Controls and Personal Protection".

[1] The matrix of this material is an atmospheric particulate substance collected in an urban area. This material contains organic compounds (PAHs, PCB congeners, and chlorinated pesticides), many which have been reported to have toxic, mutagenic, and/or carcinogenic properties, and should be handled with care. The carcinogens in this material have a total concentration < 0.1 % and **DO NOT** require individual MSDS information under current regulations [OSHA, 29 CFR 1910.1200 (g)(2)(i)(C)(1)]. For the list and actual concentrations of these compounds, see the Certificate of Analysis for SRM 1649a.

8. Exposure Controls and Personal Protection

Lead, Inorganic Fumes and Dust (as PB)

50 µg/m^3, OSHA TWA, 8 h
30 µg/m^3, OSHA action level, 8 h
0.05 mg/m^3, ACGIH TWA
0.1 mg/m^3, NIOSH recommended TWA, 10 h

Iron Powder, Iron Oxide Dust and Fume (as Fe)

10 mg/m^3, OSHA TWA
5 mg/m^3, ACGIH TWA
5 mg/m^3, NIOSH recommended TWA, 10 h (total particulate)
5 mg/m^3, UK OES TWA
10 mg/m^3, UK OES STEL

Sulfur: No occupational limits established.

Ventilation: Use local exhaust ventilation system. Ensure compliance with applicable exposure limits.

Respirator: If necessary, refer to the "NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84" for selection and use of respirators with organic vapor cartridges certified by NIOSH.

Eye Protection: Wear safety goggles. **DO NOT** wear contact lenses in the laboratory. An eye wash station should be readily available near of handling and use areas.

Personal Protection: Wear protective clothing and chemically resistant gloves to prevent skin exposure.

9. Physical and Chemical Properties

Lead
Appearance and Odor: white to gray/brown powder
Molecular Formula: Pb
Relative Atomic Mass: 207.2
Density: 11.3 g/cm^3
Decomposition Point: 1740 °C
Melting Point: 328 °C
Solubility in Water: insoluble
Solubility in Other Compounds: soluble in nitric acid and hot sulfuric acid

Iron
Appearance and Odor: white to gray/brown powder
Molecular Formula: Fe
Relative Atomic Mass: 55.8
Density: 7.6 g/cm^3
Boiling Point: 2750 °C
Melting Point: 1535 °C
Solubility in Water: insoluble
Solubility in Other Compounds: soluble in acids

Sulfur
Appearance and Odor: white to gray/brown powder
Molecular Formula: S
Relative Atomic Mass: 32.1
Density: 2.1 g/cm^3
Boiling Point: 445 °C
Melting Point: 113 °C
Solubility in Water: insoluble
Solvent Solubility: soluble in carbon disulfide, carbon tetrachloride, benzene, liquid ammonia, methylene iodide

NOTE: The physical and chemical data provided are for the pure components. Physical and chemical data for this air particulate powder mixture embedded on filter media do not exist. The actual properties and characteristics of the mixture may differ from the individual components.

10. STABILITY AND REACTIVITY

Stability: X Stable _____ Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid heat, flames, sparks, and other sources of ignition. Avoid contact with incompatible materials.

Incompatible Materials: Bases, oxidizing materials, halogens and reducing agents. The organic components in this air particulate mixture are incompatible with oxidizing agents.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition or combustion may produce toxic oxides of carbon.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: X Inhalation X Skin X Ingestion

Lead, Inorganic Fumes and Dust (as PB)

10 μg/m^3, TC_{LO} (inhalation-human)
155 mg/kg, LD_{LO} (oral-human)

Iron Powder, Iron Oxide Dust and Fume (as Fe)

77 mg/kg, TD_{LO} (oral-child)
200 mg/kg, LD_{50} (oral-human)

Sulfur

1660 mg/m^3, LC_{50} (inhalation-mammal)
170 mg/m^3, LD_{LO} (oral-human)

Health Effects (Acute and Chronic): This material may be harmful by inhalation or ingestion and is irritating to the mucous membranes and upper respiratory tract. Absorption of large amounts of lead or lead compounds may cause a metallic taste, thirst, a burning sensation in the mouth and throat, salivation, abdominal pain with severe colic, vomiting, diarrhea, fatigue, or sleep disturbances. Other signs and symptoms of exposure include metal fume fever (an influenza-like illness) disorientation, tingling sensation, convulsions, or paralysis. Prolonged or repeated

exposure to low levels of lead may result in an accumulation in body tissues and exert adverse effects on the blood, nervous system, heart, endocrine and immune systems, kidneys, and reproductive system. Lead may have reproductive effects or cause birth defects. It is also suspected as a potential carcinogen in animals.

Organics: Many of the organics in this material are known or suspected carcinogens with mutagenic properties. Exposure to organic materials can cause cough, confusion, ataxia, headache, weakness, and dizziness. Ingestion may cause abdominal pain, nausea, vomiting, and diarrhea. Most organics are liver toxins.

Medical Conditions Generally Aggravated by Exposure: Blood disorders, nervous system disorders, gastrointestinal and respiratory disorders.

12. ECOLOGICAL INFORMATION

Environmental Summary: Lead and lead compounds are toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

Waste Disposal (Lead): Dispose in accordance with all applicable federal, state, and local regulations. Hazardous Waste Number: D008. Dispose in accordance with U.S. EPA 40 CFR 262 for concentrations at or above the regulatory level of 5.0 mg/L. Keep out of sewers and water supplies.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Exempt. Small entity laboratory preparation (air particulate matter mixture).

Canadian Transportation WHMIS: Not applicable.

15. REGULATORY INFORMATION

U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): Not applicable.

SARA Title III Section 302 (40 CFR 355.30): Not applicable.

SARA Title III Section 304 (40 CFR 355.40): Not applicable.

SARA Title III Section 313 (40 CFR 372.65): Not applicable.

OSHA Process Safety (29 CFR 1910.119): Not applicable.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21) – [Lead and lead compounds]

ACUTE:	yes
CHRONIC:	yes
FIRE:	No
REACTIVE:	No
SUDDEN RELEASE:	No

STATE REGULATIONS

California Proposition 65: Not regulated.

CANADIAN REGULATIONS

WHMIS Classification: Not determined.

EUROPEAN REGULATIONS

EC Classification (Small Entity Laboratory Preparation)

Xn	Harmful
T	Toxic
N	Dangerous to the environment

EC Risk and Safety Phrases (Small Entity Laboratory Preparation)

R20/22	Harmful by inhalation and if swallowed.
R33	Danger of cumulative effects.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R61	May cause harm to unborn child.
R62	Possible risk of impaired fertility.
S45	In case of accident or if you feel unwell, seek medical advice immediately.
S53	Avoid exposure - obtain special instructions before use.
S60	This material and/or its container must be disposed of as hazardous waste.
S61	Avoid release to the environment. Refer to special instructions.

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Lead and Iron Powder are listed.

TSCA 12(b), Export Notification: Not listed.

16. OTHER INFORMATION

Sources:

MDL Information Systems, Inc., MSDS *Lead*, 17 June 2004.
MDL Information Systems, Inc., MSDS *Iron Powder*, 18 March 2004.
MDL Information Systems, Inc., MSDS *Sulfur*, 17 June 2004.